

### III. REMARKS

In the Office Action, claims 1-3 and 6-10 were rejected under 35 U.S.C. 103 as being unpatentable over Koonen (US 6674966) in view of Imajo (US 6807374) and Ames (US 5371814) for reasons set forth in the Action.

Also, other ones of the claims were also rejected under 35 U.S.C. 103 as being unpatentable over various combinations of the cited art, namely, claims 4 and 11 over Koonen in view of Imajo and Ames and Cheong (US 6477154); claim 12 over Koonen in view of Imajo and Owens (US 2004/0264446); claims 13, 15 and 16 over Koonen in view of Ye (US 6782199); claim 14 over Koonen in view of Ye and Ames; claims 17 and 20 over Koonen in view of Imajo and Ames and Cheong; and claims 18-19 over Koonen in view of Imajo, Ames, Cheong, and Ballance (US 4977593) for reasons set forth in the Action.

While the examiner has given a detailed analysis of the teachings of the cited art, as applied to the present claims, it appears that an important aspect of the invention has been omitted in the examiner's analysis for rejection of the claims. This becomes apparent from the following argument.

In the present specification, on page 1, there is presented a discussion of the prior art, wherein it is noted that various types of electronic components employed in the construction of radio frequency (RF) equipment are sensitive to the outside environment, particularly with respect to temperature. In particular, digital frequency synthesizers are mentioned as requiring a shelter with heating and air conditioning to maintain a proper environmental temperature for operating such equipment.

It is well established that such synthesizers employ a master clock or oscillator to provide a reference signal at an accurately controlled frequency. For example, the master oscillator may employ a crystal for maintenance of a base value of frequency, which frequency may be applied to a frequency multiplier circuit to obtain a desired value of reference frequency. The dimensions of a crystal may change with temperature, with the result that the value of the frequency may shift in response to a shift in temperature. This requires the placement of the digital frequency synthesizer and other such temperature sensitive components in a shelter having temperature control of the environment surrounding the temperature-sensitive components.

On page 2 of the specification, it is noted that, in the construction of a data link system, it would be advantageous to reduce the need for air conditioning. This is particularly important for equipment associated with the operation of a remote antenna.

As is explained in the SUMMARY OF THE INVENTION on pages 2-3 of the specification, and also in the text on page 5 at lines 6-8 (as well as text on page 9 at lines 20-22), the invention attains its objective by placing equipment, such as the foregoing frequency synthesis equipment, in a shelter located at a distance from the antenna, rather than placing such equipment at the antenna. Transmission of the requisite signals between the shelter and the antenna is accomplished by a fiber optic cable. Use of the fiber optic cable avoids signal loss associated with the prior use of coaxial cable (mentioned on page 1 at line 19), with the result that the signals can be transmitted over a considerable distance from shelter to

antenna, rather than being constricted to a relatively short distance as presented in present Figures 4-5 describing previous systems (pages 5, at line 9, to page 7 at line 7). The fiber optic link thus allows the locating of the radio frequency equipment (page 8 at lines 2-5) in the shelter where conditions are mild and dry.

Each of the present independent claims 1, 12, 13 and 17 recites the foregoing inventive feature, wherein, instead of placing temperature sensitive components at the antenna, there is a placing of the temperature-sensitive components at a distance from the antenna in a temperature-controlled shelter, and then connecting circuitry, comprising the temperature-sensitive components, via a fiber optic cable from the shelter to the antenna. With respect to the temperature sensitive components, in each of the independent claims, there is a paragraph describing the antenna assembly wherein, at the end of the paragraph, the claim states that the antenna assembly has transmission and/or reception components that do not have the temperature sensitivity of the RF equipment in the shelter.

In the rejection of the claims, the examiner discusses electronic components being sensitive to RF signals. However, the examiner does not discuss the claimed limitation that the antenna assembly has transmission and/or reception components that do not have the temperature sensitivity of the RF equipment in the shelter. Also, the primary reference, Koonen does not discuss this matter either.

Koonen deals with the subject of providing additional paths for transmission of electromagnetic signals to alleviate "hot spots" (Col. 1 at line 17) in a communications network. His description includes the locating of various components of the transmission

and reception equipment, but without consideration of the operating temperature range of these components. The examiner relies on Fig. 7 of Koonen that shows, at the antenna end of a fiber optic link, circuitry connected to an antenna. The circuitry includes an optical receiver 76a and an optical transmitter 78a (described in Col. 6 at lines 47-49). Neither Koonen nor the examiner gives any indication as to the nature of the construction of the Koonen optical transmitter and receiver. One would not know whether these components might include a device which may alter frequency on account of environmental temperature.

In view of the foregoing observations, it is urged that the examiner has not shown how the cited art of Koonen, considered alone or in combination with the other references, would teach one to practice the present invention, since there is no distinction between the placement of temperature-sensitive components in a shelter distant from an antenna while avoiding the placement of such components at the antenna.


It is requested respectfully that the examiner provide a further non-Final Action dealing with the omitted discussion of the above-noted inventive feature. Alternatively, it is requested that the independent claims, as well as their respective dependent claims, be found to be allowable.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.



The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,

  
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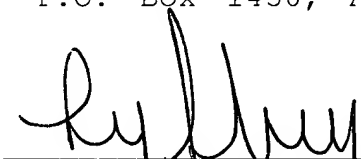
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